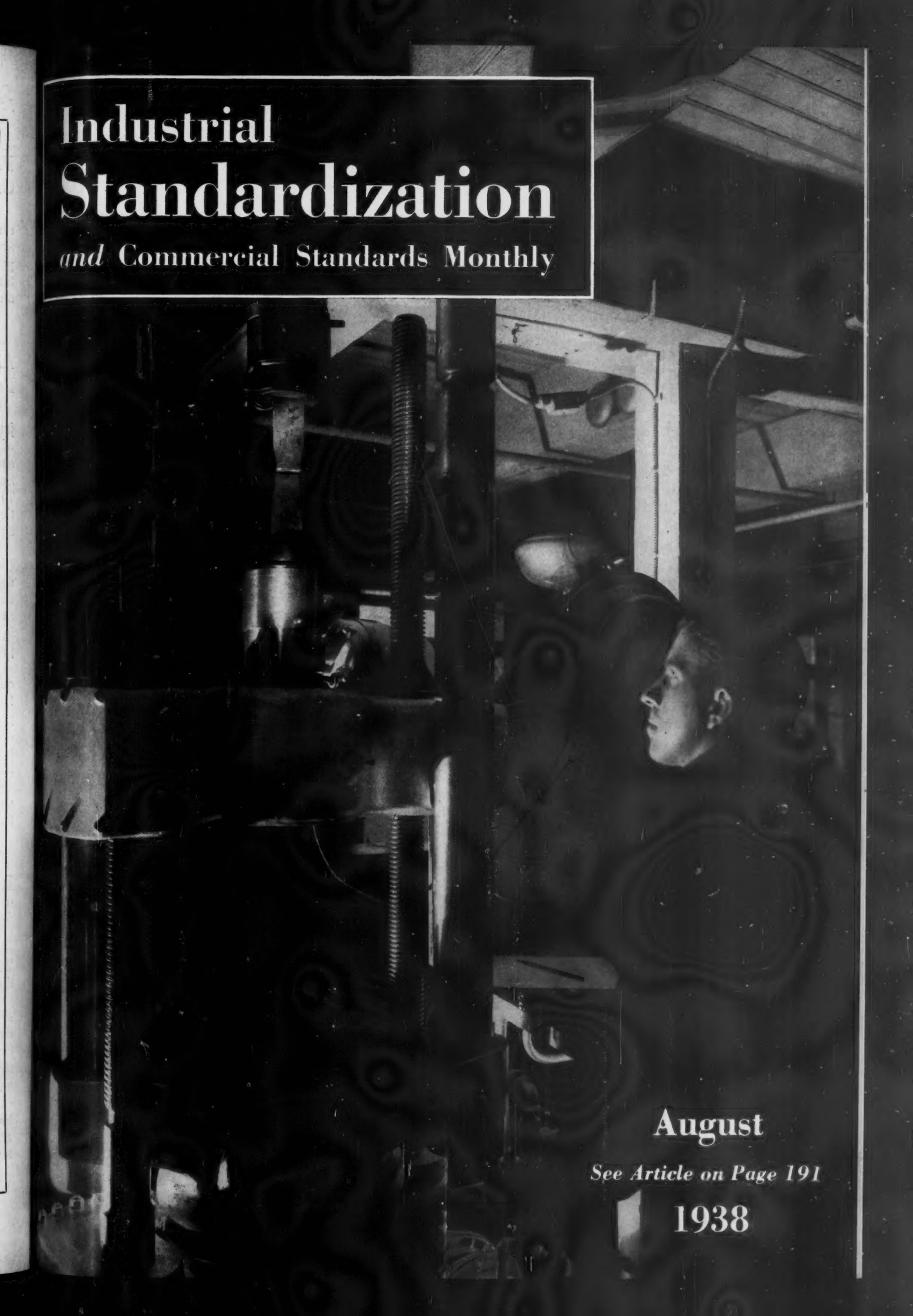


Industrial Standardization

and Commercial Standards Monthly

August

See Article on Page 191

1938

The American Standards Association

Clearing House for Standards

STANDARDIZATION is today one of the most important and appreciated activities of trade associations and technical societies. Such groups as the American Gas Association, the American Gear Manufacturers Association, the National Electrical Manufacturers Association, the Society of Automotive Engineers, have made it a major part of their programs.

The pioneering or first steps in standardization are naturally carried on by the industry or by the technical group most concerned with the subject. Many standards, however, have a significance for more than one industry or group, and the second step follows naturally —to bring the work into the American Standards Association for the development of national standards.

The American Standards Association plays the important role of national clearing house for the activities of the many groups engaged in standardization. At present more than 600 national organizations are cooperating in the work of the ASA, and of these fully three-fourths are trade associations or technical societies.

In developing a national standard, fundamental differences in point of view and in type of organization sometimes lead to controversies. One of the most useful services which the ASA performs is in supplying the type of forum which leads most easily to the solution of controversies between these national groups.

Approval by the American Standards Association, requiring a 90 per cent affirmative letter ballot vote of the representatives of some forty national bodies on the Standards Council, brings with it acceptance by a large number of groups that otherwise might not have had contact with the standard, broadening the use of the standard and increasing its effectiveness.

This clearing-house function, far from duplicating any service of trade associations, has led to the unification of the work of scores of industries and has resulted in the saving of very considerable sums. For this reason trade associations are making increasing use of the facilities of the ASA.

AMERICAN STANDARDS ASSOCIATION

Officers

Dana D. Barnum, President
P. G. Agnew, Secretary
Edmund A. Prentis, Vice-President
Cyril Ainsworth, Assistant Secretary

Board of Directors

Dana D. Barnum, Boston, Mass., President, American Standards Association

George H. Benzon, Jr., vice-president, William Sellers & Company, Inc., Philadelphia—National Machine Tool Builders Association

Carl Breer, executive engineer, Chrysler Corporation, Detroit, Michigan—Automobile Manufacturers Association

Lyman J. Briggs, director, National Bureau of Standards, Washington, D. C.—U. S. Department of Commerce

H. P. Charlesworth, assistant chief engineer, American Telephone & Telegraph Company, New York—American Institute of Electrical Engineers

C. L. Collens, president, Reliance Electric & Engineering Company, Cleveland, Ohio—National Electrical Manufacturers Association

Howard Coonley, chairman of Board, Walworth Company, New York—Past-President, American Standards Association

Wallace Falvey, vice-president, Massachusetts Bonding & Insurance Company, New York—National Conservation Bureau

F. M. Farmer, vice-president, Electrical Testing Laboratories, New York—Chairman, ASA Standards Council

J. C. Irwin, valuation engineer, Boston & Albany Railroad, Boston, Mass.—Past-Chairman, ASA Standards Council

D. J. Kerr, president, Lehigh Valley Railroad Company, New York—Association of American Railroads

John C. Parker, vice-president, Consolidated Edison Co. of New York, New York—ASA Electric Light & Power Group

Leonard Peckitt, president, Warren Foundry & Pipe Company, New York—Cast Iron Pipe Research Association

C. E. Pettibone, vice-president, American Mutual Liability Insurance Company, Boston, Mass.—National Association of Mutual Casualty Companies

J. Edgar Pew, vice-president, Sun Oil Company, Philadelphia—American Petroleum Institute

Edmund A. Prentis, Spencer, White & Prentis, Inc., New York—Vice-President, American Standards Assn.

A. R. Small, president, Underwriters' Laboratories, Chicago, Illinois—ASA Fire Protection Group

Gustave W. Thompson, member of Board, National Lead Company, Brooklyn, N. Y.—American Society for Testing Materials

R. E. Zimmerman, vice-president, U. S. Steel Corporation, New York—American Iron and Steel Institute

Standards Council

F. M. Farmer, vice-president, Electrical Testing Laboratories, New York, Chairman

R. P. Anderson, secretary, Division of Refining, American Petroleum Institute, New York, Vice-Chairman

Chairmen of Correlating Committees

Alfred Iddles, Babcock & Wilcox Co., New York—Mechanical

H. W. Brightman, vice-president, L. Bamberger & Co., Newark—Consumer

Dan Harrington, chief, Health & Safety Branch, U. S. Bureau of Mines—Mining

Rudolph P. Miller, Consulting Engineer, New York—Building

C. R. Harte, Connecticut Company, New Haven, Conn.—Electrical

L. F. Adams, General Electric Company, Schenectady, N. Y.—Safety

ASA Member-Bodies

Am. Gas Association
Am. Home Economics Assn.
Am. Institute of Bolt, Nut & Rivet Mfrs.
Am. Institute of Elec. Engineers
Am. Iron & Steel Institute
Am. Petroleum Institute
Am. Soc. of Civil Engineers
Am. Soc. of Mechanical Engineers
Am. Soc. for Testing Materials
Am. Transit Association
Assn. of American Railroads
Assn. of Am. Steel Manufacturers Technical Committees
Assn. of Gas Appliance & Equipment Mfrs.
Automobile Mfrs. Assn.
Cast Iron Pipe Research Assn.
Copper & Brass Mill Products Assn.
Electric Light and Power Group:
  Assn. of Edison Illuminating Companies
  Edison Electric Institute
Federal Housing Administration
Fire Protection Group:
  Associated Factory Mutual Fire Insurance Companies
  Nat. Bd. of Fire Underwriters
  Nat. Fire Protection Assn.
  Underwriters' Laboratories, Inc.
Institute of Radio Engineers
Mfrs. Standardization Soc. of the Valve and Fittings Industry
Nat. Assn. of Motor Bus Operators
Nat. Assn. of Mutual Casualty Companies
Nat. Conservation Bureau
Nat. Electrical Mfrs. Assn.
Nat. Machine Tool Builders' Assn.
Nat. Retail Dry Goods Assn.
Nat. Safety Council
Outdoor Advertising Assn. of America, Inc.
Soc. of Automotive Engineers
Telephone Group:
  Bell Telephone System
U. S. Department of Agriculture
U. S. Department of Commerce
U. S. Department of the Interior
U. S. Department of Labor
U. S. Govt. Printing Office
U. S. Navy Department
U. S. War Department

Associate Members

Am. Automobile Association
Am. Council of Commercial Labs.
Am. Gear Mfrs. Association
Am. Hospital Association
Am. Soc. of Heating & Ventilating Engineers
Am. Soc. of Refrigerating Engrs.
Am. Soc. of Sanitary Engineering
Am. Trucking Assns., Inc.
Am. Water Works Association
Anti-Friction Bearing Manufacturers Association, Inc.
Asphalt Shingle & Roofing Inst.
Assn. of Iron & Steel Engrs.
Associated Gen. Contractors of Am.
Brick Mfrs. Assn. of N. Y.
Grinding Wheel Mfrs. Association
Gypsum Association
Heat Exchange Institute
Illum. Engineering Society
Industrial Safety Equipment Assn.
Insulation Board Institute
Internat. Acetylene Association
Metal Lath Mfrs. Association
Motor Truck Association of Am.
Nat. Elevator Mfg. Industry, Inc.
Radio Mfrs. Association
Soc. of Motion Picture Engineers
Structural Clay Products Institute
U. S. Cap Screw Service Bureau
U. S. Machine Screw Service Bureau
U. S. Wood Screw Service Bureau
Vacuum Cleaner Mfrs. Association

Industrial
Standardization

Combined with Commercial Standards Monthly

Published Monthly by

American Standards Association
29 West 39th Street, New York

with the cooperation of the National Bureau of Standards

RUTH E. MASON, *Editor*

This Issue

Our Front Cover: Determining the strength of a steel test piece under tension. Courtesy Bell Telephone Laboratories, Inc.

International Committees Consider Agreement on Electrical Problems 181

Lombardi Named President of IEC 185

IEC Names Kennelly Honorary President 185

New Survey Shows 24 States Follow Standard Safety Glass Requirements 186

Latest State Requirements for Safety Glass 188

A.S.T.M. Committees Propose 72 New Standards 191

Standardization of Finishing Materials. By E. A. Zahn 195

New ASA Committees to Develop Standards on Building Loads and Gypsum Concrete 198

Committee Starts Work on Loading Platforms 199

University Course to Teach Industrial Safety Methods 190

Welding Handbook Just Published 194

Reaffirm Simplified Practice Recommendations 194

Safety Handbook Is for Sale 194

Propose Simplified Practice on Open Web Nailer Steel Joists 197

Need Uniform Accident Reports to Solve Traffic Accident Problem 197

British Propose Standard Apparatus for Determination of Water 199

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year U. S. and Canada (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

August, 1938 **Vol. 9, No. 8**

International Committees Consider Agreement on Electrical Problems

TO carry international standardization agreements another step forward, 400 delegates from 22 countries met at Torquay, England, June 22-July 1 for the Ninth Plenary Meeting of the International Electrotechnical Commission. Twenty-two delegates from the United States attended the nine-day meeting.

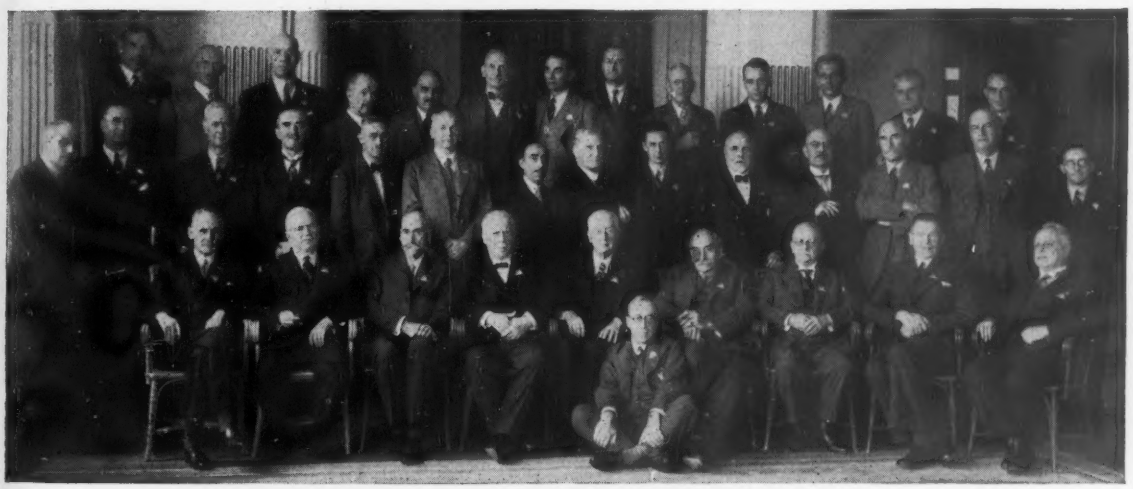
In addition to several important final agreements, notably one to coordinate the methods of rating transformers in different countries by showing both the test rating and the service rating on the nameplate, and an agreement covering the properties of aluminum for use as electrical conductors, many of the IEC committees made progress in their work.

Welding was added to the IEC program for the first time, the committee on Welding, No. 26, holding its organization meeting at Torquay.

After nearly 25 years of work on an international dictionary of electrical terms, the new "Vocabulary" with nearly 2,000 definitions in both French and English, was finally approved for publication.

A preliminary summary of some of the actions taken at the Torquay meeting is given below:

International Electrotechnical Vocabulary, IEC 1.—The first edition of the Vocabulary, containing some 2,000 scientific and technical terms defined in both French and English, and with the titles in German, Spanish, Italian, and Esperanto, was approved for publication. Copies will be sent to each of the National Committees for sale to



The IEC Committee of Action and Council at Torquay

Back Row (left to right): P. L. Alger, U.S.A.; Dr. C. C. Paterson, Great Britain; Dr. Bernard Price, South Africa; Prof. G. Niebuhr, president, Argentine National Committee; Prof. A. Barbagelata, Italy; Dr. J. Wallot, Germany; B. Pochobradsky, Great Britain; C. A. Powel, U.S.A.; I. E. Moultrop, U.S.A.; J. W. McNair, U.S.A.; G. de Zoeten, Holland; E. Patry, France; A. J. Grant, Canada.

Middle Row: P. Good, Great Britain; L. F. Adams, U.S.A.; F. H. Clough, Great Britain; Prof. G. Gillon, president, Belgian Electrotechnical Committee; H. Wiesthaler, Germany; Prof. K. Drewnowski, president, Polish Electrotechnical Committee; Dr. J. A. deArtigas, Spain; S. D. Norberg, vice-president, Swedish National Committee; K. Carstensen, Denmark; E. Huber-Stockar, president, Swiss Electrotechnical Committee; V. List, president, Czechoslovakian National Committee; Lt. Col. K. Edgcumbe, honorary secretary of the IEC; E. Uytborck, vice-president, Belgian Electrotechnical Committee; L. Ruppert, assistant secretary, IEC.

Front Row: Prof. C. L. van der Bilt, Holland; Dr. Clayton H. Sharp, president, U. S. National Committee; C. Duval, president, French Electrotechnical Committee; Prof. L. Lombardi, newly elected president of the IEC, president of the Italian Electrotechnical Committee; James Burke, U.S.A., past-president of the IEC; C. Le Maistre, General Secretary of the IEC; Roger T. Smith, president, British National Committee; Dr. M. Kloss, president, German National Committee; Prof. F. Jacobsen, president, Norwegian National Committee; Prof. G. Giorgi, Italy.

those interested. Comments received by these committees will be considered by the IEC in revising the Vocabulary.

Transformers, IEC 2B.—Two divergent methods of rating transformers have been in general use in different countries, one based on the full-load secondary current and the no-load secondary voltage, and the other based on the full-load secondary current and the full-load secondary voltage at a specified power-factor (0.8 or 0.85). The IEC meeting at Torquay agreed that both the IEC test rating, and the IEC service rating should be shown on the nameplate. It was also agreed that when no power-factor is specified by the purchaser the service rating will be based on a power-factor of 0.8, and that losses should be expressed in kilowatts and not as a percentage efficiency. Fractional loads are to be expressed in terms of current. The test rating agreed upon by the IEC as one of the factors to be used in rating transformers defines a transformer in which it might be desired to reverse the direction of flow of power, and the service rating defines a transformer with a predetermined direction of flow.

It was agreed that ambient temperature should be defined to mean that the peak value of 40C should be associated with an average temperature not exceeding 35C over any 24-hour period. The maximum temperature-rise for oil-immersed transformers, with forced oil circulation, it was agreed, should be 65C.

Graphical Symbols, IEC 3.—Proposed revisions of the IEC Graphical Symbols, IEC Publication 35, were considered. It was suggested that the National Committees submit proposals for additional sections on electronic devices (rectifiers), time switches, and clocks.

Steam Turbines, IEC 5.—The recommendations agreed upon recently by the International Standards Association should be adopted, it was agreed,

USNC Heads International Electrical Work in U.S.

In the United States the work on international electrical agreements is centralized in the United States National Committee, with headquarters in the office of the American Standards Association. The technical proposals of the United States for the 27 IEC projects are formulated by advisory committees to the United States National Committee. These committees in a large majority of cases are sectional committees operating under the procedure of the American Standards Association. The U. S. National Committee is identical with the Electrical Standards Committee of the ASA except that it has among its membership representatives of the American Society of Mechanical Engineers and a group of members at large.

The members of the United States National Committee of the International Electrotechnical Commission are:

A. E. Kennelly, *Honorary President*
C. H. Sharp, *President*
C. R. Harte, *Vice-President*
H. S. Osborne, *Vice-President*
J. W. McNair, *Secretary*

American Institute of Electrical Engineers, *A. M. MacCutcheon, V. M. Montsinger, H. S. Osborne, H. E. Farrer (alt.), R. E. Hellmund (alt.), E. L. Moreland (alt.)*

American Society of Mechanical Engineers, *Harvey N. Davis, Paul Diserens, Francis Hodgkinson, C. H. Berry (alt.), Ely C. Hutchinson (alt.)*

American Society for Testing Materials, *F. M. Farmer, C. L. Warwick (alt.)*

American Transit Association, *C. R. Harte, W. J. Quinn (alt.)*

Association of American Railroads, *Sidney Withington*

ASA Communication Group, *H. L. Huber, S. B. Graham (alt.)*

ASA Electric Light and Power Group, *P. H. Chase, H. B. Gear, H. P. Seelye, Major H. S. Bennion (alt.), A. B. Campbell (alt.), Alex. Maxwell (alt.)*

ASA Fire Protection Group, *A. R. Small, R. B. Shepard (alt.)*

Institute of Radio Engineers, *Ray H. Manson, Harold P. Westman (alt.)*

National Electrical Manufacturers Assn., *L. F. Adams, Frank Thornton, Jr., E. D. Youmans, C. H. Bissell (alt.), E. W. Seeger, (alt.), H. H. Weber (alt.)*

U. S. War Department, *Col. A. S. Cowan, Lt. Col. S. W. Stanley (alt.)*

U. S. Navy Department, *Officer in charge—Specification Section, Design Division, Bureau of Engineering*

National Bureau of Standards, *E. C. Crittenden, J. F. Meyer (alt.)*

Members-at-large, *James Burke, W. F. Durand, A. E. Kennelly, I. E. Moultrop, H. S. Osborne, Harold Pender, C. H. Sharp, C. E. Skinner*

with the understanding that any changes in the ISA material should be submitted to the IEC. The exchange of information will, however, be reciprocal, it was decided, the IEC sending its suggestions to the ISA.

Flow of fluids in a pipe should be measured by means of nozzles or orifice plates, or calibrated Venturi tubes, it was decided.

Guarantees on straight condensing turbines should be expressed as steam flow and power output, and not in terms of heat rate, it was decided. Performance tests carried out under conditions differing from the specified conditions should be corrected by means of curves forming part of the contract, it was agreed.

Lamp Caps and Holders, IEC 6.—Dimensions of lamp caps and holders, approved by this committee, will be published by the IEC. Drawings of gages were approved, but each National Committee, will of course decide for itself what gages would be used for checking the dimensions.

Define Annealed Aluminum

Aluminum, IEC 7.—It was unanimously agreed that annealed aluminum should be defined as aluminum which, in the form of wire of 1 mm diameter and greater, has a maximum tensile strength of 9.5 kg and a minimum elongation of 20 per cent in a length of 200 mm. The measurement of the elongation is to be taken after fracture. The normal resistivity value should be 0.0278 ohm mm^2/m at a temperature of 20C. The temperature coefficient and density for hard-drawn aluminum are considered the same as for annealed aluminum. For the steel core it was agreed to adopt a minimum tensile strength of 120 kg/mm^2 and an elongation of 5 per cent for wires of 3 mm diameter and over, and 4 per cent for wires which are smaller than 3 mm diameter. Standards of resistivity for aluminum used for insulated cables and bus bars were agreed upon.

To Issue Insulator Tests

Standard Voltages and High-Voltage Insulators, IEC 8.—A column showing the three-phase phase-voltages corresponding to the three-phase phase-to-neutral voltages will be included in the new edition of the IEC publication on Standard Voltages, in the section on voltage between 100 and 1,000 volts. The first edition of an international specification on the testing of insulators will be issued, it was agreed. Impulse voltage tests for the testing of line insulators will be included.

A draft specification for testing bushing insulators was referred to the national committees for consideration.

The meeting referred a draft specification for testing bushing insulators to the national committees for consideration, and approved a report recommending the revision of the IEC calibration tables for sphere-gaps.

Electric Traction Equipment, IEC 9.—A revised edition of the specification for traction motors will be circulated to the national committees for approval.

Radio Communication, IEC 12.—Draft specification for condensers as used in radio receivers and in radio-interference suppressing devices and for symbols relating to electrodes and electrical magnitudes of electronic tubes were considered but no action was taken. A revised draft of pro-

26 International Electrical Projects

Twenty-six committees are working on international electrical problems under the procedure of the International Electrotechnical Commission. Each committee is under the secretariat of one of the National Committees. These IEC committees, and the National Committee which holds the secretariat for each, are:

1. Nomenclature, U. S. National Committee
2. Rating of Electrical Machinery, British National Committee
3. Symbols, Swiss National Committee
4. Hydraulic Turbines, U. S. National Committee
5. Steam Turbines, U. S. National Committee
6. Lamp Caps and Holders, Central Office
7. Aluminum, Central Office
8. Voltages and High Voltage Insulators, Italian National Committee
9. Electric Traction Equipment, French National Committee
10. Insulating Oils, Central Office
11. Rules and Regulations for Overhead Lines, Belgian National Committee
12. Radio Communications, Dutch National Committee
13. Measuring Instruments, German National Committee
14. Rating of Rivers, U. S. National Committee
15. Shellac, British National Committee
16. Terminal Markings, Dutch National Committee
17. Oil Switches and Circuit Breakers, Swedish National Committee
19. Internal Combustion Engines, U. S. National Committee
20. Electric Cables, British National Committee
21. Accumulators, German National Committee
22. Electronic Devices (for Power Applications)
23. Electrical Fittings
24. Electrical and Magnetic Magnitudes and Units
25. Letter Symbols
26. Electric Welding
27. Electro-Heating

IEC Work Valuable to International Trade

The International Electrotechnical Commission's work in coordinating and simplifying industrial requirements in the electrical field should prove of the highest value to international exchange of electrical goods, said the Duke of Kent at the dinner to the IEC delegates given by the British Standards Institution at Guildhall, London. This coordination should be increasingly valuable as the economic interdependence of the nations is more fully recognized, he said.

posed safety regulations for mains-operated radio receivers is to be prepared.

Study Marking of Instruments

Electrical Instruments, IEC 13.—Revision of the publications on alternating current watt-hour meters; instrument transformers; and indicating instruments was discussed, and action will be taken later. This committee held a joint meeting with the Advisory Committee on Terminal Markings, and the two committees appointed a subcommittee to consider marking instrument transformers separately from instruments and meters.

Shellac, IEC 15.—A report on progress in application of shellac in the electrical industry during the past three years was presented by the chairman, A. J. Gibson of Great Britain.

Terminal Markings, IEC 16.—A report by this committee summarized the systems of terminal markings now in use as follows:

(a). The system used in the United States as given in the American Standard for Rotation, Connections and Terminal Markings for Electric Power Apparatus.

(b). The system used in Great Britain which will be available soon as a report of the British Standards Institution, and

(c). A composite system taking certain of its parts from the systems of the different nations on the Continent of Europe, the composite being arrived at in discussions in IEC Advisory Committee Number 16.

It is expected that the IEC will now print the composite system as a report in the hope that as the various nations find it necessary to change their existing systems they will be able to adopt this system in whole or in part.

The IEC will also publish a separate report giving the history of the whole situation on terminal markings, explaining the three separate systems and giving information as to where detailed information on all of them may be obtained.

Switchgear, IEC 17.—Insulation tests, impulse voltage tests, the natural frequency of the test circuit and the rate-of-rise of recovery voltage and the testing of large circuit-breakers were discussed.

Internal Combustion Engines, IEC 19.—A revised draft of the specifications proposed for internal combustion engines will be circulated to the national committees for approval.

Electric Cables, IEC 20.—A revision of the IEC specifications was suggested and proposed changes were submitted to a subcommittee for consideration.

Electronic Devices, IEC 22.—This committee is working on a draft specification for mercury-arc rectifier equipment.

Electric and Magnetic Magnitudes and Units, IEC 24.—It was agreed that the committee recommend that the connecting link between the electrical and mechanical units should be the permeability of free space (μ_0) with the value of 10^{-7} in the unrationalized system, or $\pi 10^{-7}$ in the rationalized system. The committee also agreed to recommend that the name of the unit of force should be the "Newton."

Letter Symbols, IEC 25.—A revised edition of IEC publication 27 will be circulated to the national committees for approval.

First Meeting on Welding

Electric Welding, IEC 26.—The first meeting of this committee decided that it will start its program with work on welding plant and equipment, and that it will cooperate with the committee on welding of the International Standards Association. Definitions, rating of welding plant and equipment, non-automatic single-arc direct-current welding sets, automatic single-arc direct-current welding sets, constant-voltage multiple-arc direct-current welding sets, electric motors, air-cooled direct-current reactors, and chokes and transformers were discussed. Proposals made by the British Committee will be reviewed and referred to the various National Committees for their recommendations.

More detailed reports of these committee meetings will be available after all the American delegates have returned to the United States. Any one wanting additional information should write to J. W. McNair, secretary of the U. S. National Committee of the International Electrotechnical Commission, American Standards Association, 29 West 39 Street, New York.

Lombardi of Italy Is IEC President

PROFESSOR L. Lombardi, one of the leading electrical experts of Italy, was elected president of the International Electrotechnical Commission at a meeting of the IEC Council at Torquay June 29. Professor Lombardi succeeds James Burke of the United States National Committee who was elected president of the IEC at its last Plenary Assembly in 1935.

Organized in 1906 to act as a permanent "world congress" on electrical problems, the IEC now has 26 countries in its membership. Opinion on international electrical problems is correlated in each member country through a National Committee, which represents all sections of that country's electrical industry.

The IEC was a direct outgrowth of several international meetings of electrical engineers, each organized for the special occasion and their programs having little continuity. At the first, the International Electrical Congress held in 1881, names for the principal electrical units were definitely agreed upon. This Congress was a forerunner of later congresses held in 1893, 1896, 1900, and 1904.

At the Congress at St. Louis in 1904, Colonel R. E. Crompton of Great Britain presented a paper on the Rating of Machinery, which raised the question of international agreements on rules for rating electrical machinery. Believing that a permanent organization would be helpful in bringing about better international understanding, the St. Louis Electrical Congress resolved that "steps should be taken to secure the cooperation of the technical societies of the world by the appointment of a representative Commission to consider the question of standardization of the Nomenclature and Ratings of Electrical Apparatus and Machinery."

Colonel Crompton made the necessary arrangements, and in June, 1906, representatives of 12 countries met in London and organized the International Electrotechnical Commission. By 1908, 14 National Committees had been formed. The growth of the organization and recognition of its importance is shown in meetings held since 1926. In that year 120 delegates representing 18 nations met in New York; in the 1938 meetings over 400 delegates represented 22 countries.

The 26 countries which are members of the International Electrotechnical Commission are: Argentina, Australia, Belgium, Canada, China, Czechoslovakia, Denmark, Egypt, France, Germany, Great Britain, Holland, Hungary, India, Italy, Japan, Norway, Poland, Portugal, Rumania, Spain, Sweden, Switzerland, the United States, the USSR, and Yugoslavia.

C. LeMaistre, secretary of the British Standards Institution, is General Secretary of the IEC.

IEC Names Kennelly Honorary President

IN recognition of his outstanding career in electrical engineering and particularly of his work in promoting national as well as international standards, the International Electrotechnical Commission elected A. E. Kennelly, Professor Emeritus of Engineering, Harvard University, honorary president at the meeting of the IEC Council, Torquay, June 29.

Professor Kennelly is also honorary president of the United States National Committee.

Beginning his engineering career at the early age of 14 when he acted as assistant secretary of the Society of Telegraph Engineers, he became operator for the Eastern Telegraph Company when he was 15, and from there went to the positions of assistant electrician, chief electrician for a cable repairing steamer and senior ship electrician on submarine cables. In 1887, when he was 26, he came to America and became the principal assistant to Thomas A. Edison. Later, in addition, he was consulting electrician for the Edison General Elec-

(Continued on page 190)

New Survey Shows 24 States Follow Standard Safety Glass Requirements

Follow-up brings American Standards Association's findings on use of American Standard for safety glass up-to-date

TWENTY-FOUR states and the District of Columbia have adopted the American Standard Safety Code for Safety Glass, a new survey by the American Standards Association on the use of safety glass now discloses. Of the other states, three have their own specifications to which safety glass must comply, one provides in general terms that the glass must be manufactured in order substantially to prevent shattering, one expects to adopt the Interstate Commerce Commission regulations, two accept reports of tests made according to National Bureau of Standards' requirements, three provide that the glass must be approved by specified state departments, and two have no requirements to which safety glass must comply. Eleven states, the survey shows, have no regulations requiring that safety glass be used in motor vehicles.

A follow-up to all of the states, using the original chart as the basis for the new questionnaire, resulted in additional information in many cases, and changes in some of the original answers. On the following pages, the American Standards Association offers its revised chart showing the various state requirements for the use of safety glass.

Wanted Uniform Definition

As explained in our article on Safety Glass which presented the original chart (INDUSTRIAL STANDARDIZATION, March, pages 58-61) the growing use of "safety" glass in automobiles, and the adoption of a variety of legislative requirements for its use, resulted in a confused situation troublesome to all concerned. As a result, automobile and glass manufacturers, state administrators, and users of automobiles met together under the auspices of the American Standards Association to agree on tests and specifications which would bring about a uniform definition of safety glass. These tests and specifications have been adopted not only by the 37 states and District of Columbia shown on this chart but also by the Interstate Commerce Commission for trucks and buses operating in interstate commerce. The ICC, however, makes one exception to the complete use of the American Standard. As the result of investigations and hearings carried out by the Commission recently, all use of "case-hardened" glass has been prohibited in certain motor vehicles under ICC jurisdiction, in which the ICC requires the use of safety glass.

On the revised chart shown on pages 188 and 189, Idaho, Mississippi and South Dakota have been changed from the "no requirements" list to the list of states which show some safety glass regulation. Important changes in the reports on types of safety glass prohibited are shown for California, Louisiana, Maine, Nebraska, Ohio, and Virginia.

New statements concerning requirements for approval by testing laboratories are shown by Louisiana and Minnesota, and Minnesota supplements its original statement by saying that manufacturers may be required to submit samples for tests. Virginia changes its original statement in answer to the question, "Is the manufacturer required to submit samples for test?" to a simple "Yes." Connecticut indicates that it has come to a definite decision as to whether the American Standard label is sufficient without additional laboratory tests with its definite answer, "No, we require laboratory tests made according to the American Standard." Louisiana and Minnesota also submit new replies to this question, and Nebraska changes its reply which originally was, "No, but should be," to the more definite. "No, but label is required."

To the question, "Have Specifications other than the American Standard Safety Code been adopted," the District of Columbia, Minnesota,

and Nebraska now give a definite, "No," and Louisiana qualifies its answer by adding, "the State Highway Commission adopted the American Standard."

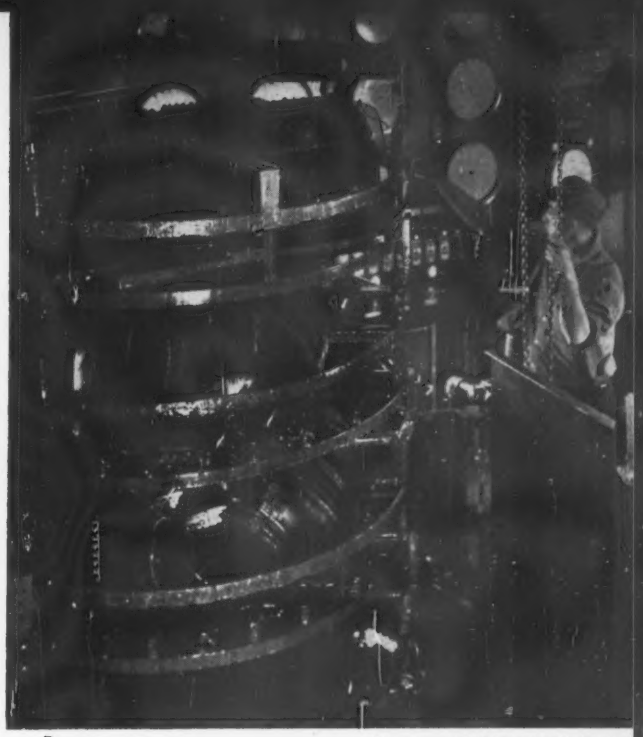
Illinois now adds to its reply by saying that the American Standard Safety Code is not formally adopted but approvals are issued only after tests show that glass meets requirements of the National Bureau of Standards. Minnesota answers an unqualified, "Yes," to this question, and Nebraska says that approvals are based on the American Standard tests.

Little Change Shown

Very little change is shown on the question whether safety glass is required to comply with a standard or pass a test, the one important change being Pennsylvania's reply that the glass must be manufactured to prevent shattering and must be approved by the Department of Revenue.

The same is true in regard to the question, "Is safety glass required for use in automobiles?" The most important change here is in the answer from Virginia, which adds that since 1935 busses and taxicabs must use safety glass.

The American Standard was revised this year to permit the use of the abbreviation "AS" in the label on the glass to indicate that it meets the requirements of the standard. In view of its wide acceptance the standard was advanced to the status of American Standard rather than American Tentative Standard.



Courtesy Pittsburgh Plate Glas

Pressure and heat make a single pane of laminated glass from these glass "sandwiches". Each is made up of two pieces of polished plate glass with a sheet of pyroxyline placed between them.

How States Provide for Use of Safety Glass

Use American Standard Safety Code

Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Idaho
Iowa
Louisiana
Maine
Massachusetts
Minnesota
New Hampshire
New York
North Carolina
Ohio
Oklahoma
Rhode Island
South Carolina
South Dakota
Utah
Vermont
Virginia
Washington
West Virginia

Approval Based on Tests Outlined in American Standard

Nebraska

Have Their Own Specifications

Maryland
New Jersey
Wisconsin

Glass Must Be Approved by Specified State Department

Mississippi
Missouri
Pennsylvania

Expect to Adopt ICC Requirements

Tennessee

Accept Test Reports Showing Glass Meets Requirements of National Bureau of Standards

Illinois
Kansas

General Provision Against Shattering

Michigan

No Requirements for Safety Glass to Meet

Indiana
Oregon

Do Not Require Use of Safety Glass

Alabama
Arizona
Florida
Georgia
Kentucky
Montana
Nevada
New Mexico
North Dakota
Texas
Wyoming

LATEST STATE REQUIREMENTS FOR SAFETY GLASS

(as of August 15, 1938)

Name of State	Is safety glass required for use in automobiles?	Has the American Standard—"Safety Code for Safety Glass for Glazing Motor Vehicles . ." been adopted?	Have specifications other than the American Standard been adopted?	Is the American Standard label requirement sufficient without additional laboratory tests?	Is the manufacturer required to submit samples for tests?	Does the State accept the approval of testing laboratories or agencies other than its own?	Are any types of safety glass prohibited for: (a) Passenger cars (b) Trucks (c) Busses
Arkansas	Yes, passenger cars, trucks, and busses after Jan. 1, 1938.	Yes			Yes	"Yes, Elec. Testing Lab., Underwriters' Lab., Nat. Bur. of Stds. or any other engg lab. of equal repute and shall include re-examination service."	
California	Yes, new passenger cars, trucks, and busses, since Jan. 1, 1936. School busses since 1932.	Yes		Require label and also examine laboratory reports.	No	Yes, Elec. Testing Lab., Nat. Bur. of Standards and any other recognized agency.	Heat-treated glass approved for windows and doors of motor vehicles, but not for windshields. Not approved for school busses. Wire glass not approved for any motor vehicles.
Colorado	Yes, windshields in passenger cars and trucks. Throughout in busses.	Yes		No, manufacturer must submit copies of laboratory tests and samples.	Must submit samples for files.	Yes, Elec. Testing Lab., Nat. Bur. of Stds.; others of high standing.	Will follow the provisions of the American Standard as to use of various types of glass.
Connecticut	Yes, throughout in passenger cars, trucks, and busses.	Yes		No. Require lab. tests made in accordance with Am. Std.	No	Yes, Elec. Testing Lab. or any other equipped to make these tests.	Will follow the provisions of the American Standard as to use of various types of glass.
Delaware	Yes, throughout in passenger cars, trucks, and busses, since July 1, 1935.	Yes		Yes, subject to check tests to be made at the discretion of the Commissioner.	Yes	Yes, Nat. Bur. of Stds.; any comm. lab. engaged by the Commissioner.	Will follow the provisions of the American Standard as to use of various types of glass.
District of Columbia	Yes, throughout in passenger cars, trucks, and busses.	Yes	No	Yes	No	Will accept only the approval of the American Standards Association.	Will follow the provisions of the American Standard as to use of various types of glass.
Idaho[1]	Yes, Public Utilities Comm. reg. require safety glass in windshield and window next to driver in bus, truck, or truck-tractor; doors & rear windows of bus, rear window of driving compartment of truck or truck-tractor for replacements, and for new equipment after July 1, 1937.	Yes, in Public Utilities Comm. regulations					"Tempered" or "case-hardened" glass shall not be used to meet these requirements.
Illinois	Yes, throughout in passenger cars, trucks, and busses.	Am. Std. not formally adopted, but approvals issued only after test reports showing glass meets requirements of Nat. Bur. of Stds.			Yes	No	None
Indiana	Yes, passenger cars, trucks, and busses, after Jan. 1, 1936.						
Iowa	Yes, throughout in passenger cars, trucks, and busses.	Yes		Yes	No		
Kansas	Yes, in windshields in passengers cars and trucks, after Jan. 1, 1938. Throughout in busses.	Am. Std. not formally adopted but approvals issued only after test reports showing glass meets requirements of Nat. Bur. of Stds.		No, copy of approval from Nat. Bur. of Stds. or commercial testing lab. report together with marked samples are necessary.	Yes, samples are required for checking purposes.	Yes, Elec. Testing Lab., New York.	Heat-treated glass is prohibited in windshields.
Louisiana	Yes, passenger cars, trucks, and busses, after Jan. 1, 1937.	State Highway Comm. adopted Am. Std.	Law states that tests shall be in accordance with "recognized specifications."	No, highway engr. required to test samples, or accept test reports of Nat. Bur. of Stds.	No, Comm. of Highways must keep approved list conforming to Am. Std.	Yes, Nat. Bur. of Stds.	Only laminated glass permitted in school busses and vehicles for hire except taxicabs.
Maine	Yes, throughout in passenger cars, trucks, and busses.	Yes		Yes, American Standard label.	No	Yes, Nat. Bur. of Stds.	Will follow provisions of Am. Std. as to use of various types of glass.
Maryland	Yes, throughout in passenger cars, trucks, and busses.	No	There are State "Specifications covering the approval of safety glass for State of Maryland."		No, mfr. is required to submit complete laboratory report to the Commissioner. A certificate will then be issued.	Yes, Elec. Testing Lab., New York.	Heat-treated and wire glass are prohibited in all types of motor vehicles operated on Maryland highways.
Massachusetts	Yes, throughout in passenger cars, trucks, and busses.	Yes		No	Yes, manufacturer must submit samples.	Yes, Elec. Testing Lab., New York, and Nat. Bur. of Standards.	Will follow the provisions of the Am. Std. as to use of various types of glass. Nothing but laminated plate glass permitted in windshields.
Michigan	Yes, throughout in passenger cars, trucks, and busses after July 1, 1934. Throughout in cars for hire regardless of date.	No	No, must provide against shattering.		Law requires that glass must be of sufficient consistency to provide against shattering on all cars manufactured after July 1, 1934.		
Minnesota	Yes, throughout in passenger cars, trucks, and busses.	Yes		No	Mfrs. may be required to submit samples for tests.	Yes, Nat. Bur. of Stds. or other recognized testing labs., if reports show tests used and results.	Only laminated type of glass will be approved by the Commissioner for use in windshields; heat-treated glass for use in other parts of the vehicle.
Mississippi	Yes, throughout on new motor vehicles after July 1, 1939. School busses after July 1, 1940.	No	Glass must be approved by Commissioner of Public Safety.				
	Yes, throughout in passenger cars and		Missouri specifica-				

					after July 1, 1934.		
Minnesota	Yes, throughout in passenger cars, trucks, and busses.	Yes		No	Mfrs. may be required to submit samples for tests.	Yes, Nat. Bur. of Stds. or other recognized testing labs., if reports show tests used and results.	Only laminated type of glass will be approved by the Commissioner for use in windshields; heat-treated glass for use in other parts of the vehicle.
Mississippi	Yes, throughout on new motor vehicles after July 1, 1939. School busses after July 1, 1940.	No	Glass must be approved by Commissioner of Public Safety.				
Missouri	Yes, throughout in passenger cars and busses, also trucks if passengers are carried for hire.	No	Missouri specifications are the same as those of the State of Pennsylvania.		Yes	No	
Nebraska	Yes, throughout in passenger cars, busses, and also trucks if passengers are carried other than the driver.	Am. Std. not formally adopted but approvals are based on tests outlined.	No	No, but label is required.	Yes	No	Heat-treated glass is prohibited in windshields.
New Hampshire	Yes, throughout in passenger cars, trucks, and busses.	Yes		No	Yes	Yes, Nat. Bur. of Stds. and Elec. Testing Lab.	American Standard is followed.
New Jersey	Yes, passenger cars, trucks, and busses.	Not as yet.	New Jersey has special state specifications.		Not as yet.	Yes	Wire glass is prohibited. New Jersey contemplates adoption of Am. Std.
New York	Yes, throughout in passenger cars, trucks, and busses.	Yes		Yes, but must have evidence of passage of test.	Yes	Yes	No prohibiting list.
North Carolina	Yes, throughout in passenger cars, trucks, and busses.	Yes			Yes	Yes, National Bureau of Standards.	
Ohio	Yes, throughout in passenger cars, trucks, and busses.	Yes, American Standard has been adopted.		Ohio reserves right to make check tests Registrar of Motor Vehicles deems necessary and to make complete tests on new brands.	Yes	Ohio does its own testing.	Heat-treated glass is prohibited in windshields. Wire glass is not approved for any automobile glazing.
Oklahoma	State law requires safety glass in school busses and vehicles conveying passengers for hire. Dept. of Public Safety requires safety glass in trucks.	Yes, by the Dept. of Public Safety for trucks.	No. "We will follow all recommendations set up by the American Standards Association."		Law requires sellers or owners of busses and vehicles for hire to certify type of glass used.		"Tempered" or "case-hardened" glass shall not be used to meet safety glass requirements affecting trucks. Specific types of heat-treated glass have been approved by Dept. of Safety for busses and other vehicles carrying passengers for hire, except in windshields.
Oregon	In school busses.	No	No				
Pennsylvania	Yes, throughout in passenger cars, trucks, (cab), and busses.		Law states glass must be mfd. substantially to prevent shattering, and approved by Dept. of Revenue	No	Yes	Yes, Electrical Testing Lab., New York.	Heat-treated not permitted unless approved by Dept. of Revenue. Wire glass restricted.
Rhode Island	Yes, throughout in passenger cars and trucks after Jan. 1, 1938. Throughout in busses since 1930.	Yes		Yes	No	Yes, Engineering Laboratory, New York.	Wire glass is prohibited.
South Carolina	Yes, throughout in passenger cars, trucks, and busses.	Yes		Yes		Am. Std., Z26.1-1935. Nat. Bur. of Stds.	The provisions of the American Standard are followed.
South Dakota[1]	Yes, in regulations of the Railroad Comm. for busses, trucks, and truck tractors.	Yes, in Railroad Comm. regulations.		No	No		"Tempered" or "case-hardened" glass prohibited in busses, trucks, and truck tractors.
Tennessee	Busses, trucks, and truck tractors are required to be equipped with safety glass.		Contemplate adoption of Interstate Commerce Comm. regulations.[2]				
Utah	Yes, throughout in passenger cars, trucks, and busses.	Yes		Yes	Yes	Yes, recognized testing laboratory.	The provisions of the American Standard are followed.
Vermont	Yes, throughout in passenger cars, trucks, and busses after Jan. 1, 1936.	Yes		Yes	No	Yes, accept results of tests made by New York State and Massachusetts.	
Virginia	Yes, throughout in all vehicles after Jan. 1, 1936. In busses, school busses, and taxicabs since 1935.	Yes, and we accept photostatic copies of lab. reports made in line with Am. Std., in lieu of any other test for this or any other state.		No, we require filing here of a photostatic copy of any laboratory reports indicating compliance with the American Standard.	Yes	Yes, any testing lab. having arrangement with Nat. Bur. of Stds. whereby appeal may be made to the Bureau in the event of a discrepancy.	Heat-treated glass prohibited in all windshields, and throughout in vehicles carrying passengers for hire. Wire glass is prohibited.
Washington	Yes, throughout passenger cars, trucks (cab), and busses after Jan. 1, 1938.	Yes		Label required, but additional laboratory test is required.	Yes, sample required, size one square foot.	Yes, National Bureau of Standards, and Electrical Testing Laboratory, New York.	The Am. Std. is followed, except that some heat-treated glass by specific authorization is Washington, Class B, and not authorized for use in windshields.
West Virginia	Yes, throughout in passenger cars, trucks, and busses.	Yes		Yes	Yes	Yes, National Bureau of Standards only.	
Wisconsin	Yes, throughout in passenger cars, trucks, and busses after Jan. 1, 1936.	No	Wisconsin has special state specifications.		Yes, sample must be submitted, size one square foot, with report of tests.	In accordance with Wisconsin state specifications.	

NOTE:—There are no requirements for the use of safety glass for motor vehicles—August, 1938—in Alabama, Arizona, Florida, Georgia, Kentucky, Montana, Nevada, New Mexico, North Dakota, Texas, and Wyoming.

[1]There is no state law requiring the use of safety glass in Idaho and South Dakota. The 1937 South Dakota legislature passed a law giving the Railroad Commission power and authority to pass certain rules in connection with the operation of motor carriers in the transportation of persons or property for hire. In Idaho the Public Utilities Commission has this authority.

[2]Interstate Commerce Commission regulations require safety glass in the windshield and window next to the driver in a bus, truck, or truck tractor; in the doors, and rear windows of a bus, and in the rear window of the driving compartment of a truck or truck tractor. Safety glass shall conform to the American Standard, except that the use of "tempered" or "case-hardened" glass is not permitted.

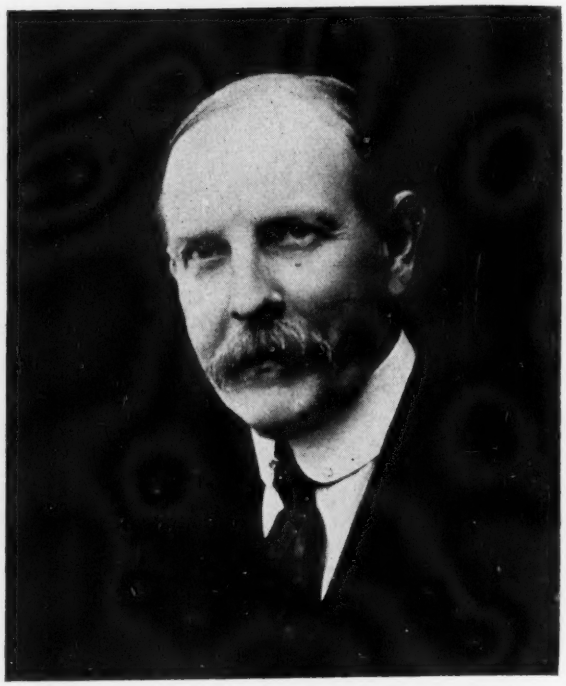
(Continued from page 185)

tric and the General Electric Companies, and from 1894 to 1901 was a member of the consulting firm of Houston and Kennelly. In 1902 he had charge of the laying of the Vera Cruz-Frontera-Compeche cable for the Mexican Government. That same year Doctor Kennelly was appointed professor of electrical engineering at Harvard University, and in 1930 became professor emeritus of that institution and of the Massachusetts Institute of Technology.

One of Dr. Kennelly's chief contributions to applied science is a paper on "Impedance" presented in 1893 before the American Institute of Electrical Engineers, containing the first use of complex numbers as applied to Ohm's Law in alternating-current engineering. In 1902, he expounded a theory on the influence of a conducting layer in the Atmosphere on Long-Distance Radio Transmission which has since been verified experimentally and has resulted in the naming of the so-called ionized layer of reflection the Kennelly-Heaviside layer.

Dr. Kennelly was a United States delegate to the international electrical congresses in Paris in 1900 and 1904, and was general secretary of the latter congress at which the recommendation was made that a permanent international commission be organized to consider standardization in the electrical field.

He has received many medals and awards. among them the Institution Premium in 1887 and the Fahie Premium in 1889 from the Institution of Electrical Engineers, London; the Longstreth silver medal in 1916 and the Howard Potts gold medal in 1917 from the Franklin Institute; the Volta medal in 1927, and the Cross of a Chevalier of the Legion of Honor of France; and the Edison Medal of the American Institute of Electrical Engineers, 1933.



Courtesy American Institute of Electrical Engineers

A. E. Kennelly

Dr. Kennelly is a past-president of the American Institute of Electrical Engineers, the Institute of Radio Engineers, and other scientific organizations, and has been active in the standardization work of the AIEE as well as in the American Standards Association and the International Electrotechnical Commission. He is now chairman of the IEC Advisory Committee on Electric and Magnetic Magnitudes and Units, of the Sectional Committee on the same subject under the procedure of the American Standards Association, and also of the sectional committee on Definitions of Electrical Terms.

University Course to Teach Industrial Safety Methods

Ainsworth Will Help Advise on Program

Cyril Ainsworth, Acting Secretary of the American Standards Association, has accepted an appointment to serve as a member of the Advisory Committee now being set up to help plan a course on Industrial Accident Prevention to be given at New York University. The course will be set up by the new Center for Safety Education, established by a grant of funds from the National Conservation Bureau through the Association of Casualty and Surety Executives.

Ten courses have already been set up by the Center in Safety Education, primarily for teachers and supervisors. The new course on Industrial Accident Prevention will, however, have for its purpose the training of industrial safety workers.

The course, which will meet in the evening once a week for the first term beginning October 1, will carry University credits in the College of Engineering.

A.S.T.M. Committees Propose 72 New Standards

SEVENTY-TWO new tentative specifications and tests are being published by the American Society for Testing Materials as the result of action taken during the annual meeting at Atlantic City, June 27 to July 1. In addition, 33 existing tentative specifications were approved to be referred to letter ballot for adoption as formal standards, and revisions in 64 tentative standards were approved.

New specifications for normalized quenched-and-tempered steel forgings were offered by Committee A-1 on Steel. As the result of subcommittee meetings during the annual meeting, proposed new specifications covering lap-welded and seamless steel iron boiler tubes were perfected. It is expected that they will eventually replace the existing standard. New specifications covering medium carbon and carbon-molybdenum seamless steel boiler tubes and spiral welded pipe were also completed. Active work will continue in the development of specifications for pipe and tubing, it was reported, including electric-resistance-welded heat-exchanger and condenser tubes and steel boiler tubes for high-pressure service.

Demand for a standard method of measuring interlamination resistance to replace the many methods now in use brought about a proposal by Committee A-6 on Magnetic Properties of a tentative method of test for measuring this property of steel. This method is applicable to electrical sheet or strip steel and indicates the effectiveness of the sheet surface oxides or coatings in reducing intersheet losses, it was reported.

Revised Cable Standard

An extensive revision of the standard requirements for bare stranded copper cable, B 8-36, was proposed. The revision took the form of a new tentative specification sufficiently inclusive to warrant the withdrawal of the Tentative Specifications for Hard-Drawn Copper Transmission Cable (B 87-32 T). The committee decided to continue the existing standard B 8-36, and also to publish the tentative standard B 8-38 T.

The committee on Electrical-Heating, Electrical-Resistance, and Electric-Furnace Alloys, B-4, developed two new test methods, one covering temperature constants of sheet materials for shunts and precision resistors, and a method for bend testing of wire for radio tubes and incandescent lamps.

Steadily growing interest in connection with water for industrial uses resulted in one complete session of the annual meeting devoted to this subject. Committee D-19 in charge of the session presented seven proposed methods, the first covering the sampling of plant or confined waters for industrial uses. It is designed to furnish general technical information for securing representative samples of water for analysis.

Three new tentative standards, one for determination of the yield of concrete, another covering a test for soundness of aggregates by freezing and thawing, and a third covering sieve analysis of fine and coarse aggregates, were proposed in

Our Front Cover

Determining the strength of a steel test piece under tension

The importance of applying the load uniformly in tests such as this was given renewed attention recently when committees of the American Society for Testing Materials added provisions in A.S.T.M. standards urging the testing engineer to follow standard procedures more exactly. Although the machine in which this test is being performed does not automatically control the rate at which the load is applied, by its form of drive it does elongate the test specimen at a constant rate.

The photograph was furnished through the courtesy of the Bell Telephone Laboratories, Inc.

the report presented by the Committee on Concrete and Concrete Aggregates, C-9. The method for yield covers a procedure for determining the volume of freshly mixed concrete produced from a mixture of known quantities of ingredients from which may be calculated the yield, that is the volume of concrete per unit volume of cement. The freezing and thawing test should furnish information helpful in judging the soundness of aggregates subjected to weathering action, the committee reported. Committees D-4 and C-9 jointly prepared the new tentative methods of test for sieve analysis of fine and coarse aggregates, giving in a single method requirements covered previously in four standards.

Add to Cement Analysis

A new quick method for determining manganese oxide in cement and new methods for determining potassium oxide and sodium oxide were accepted as tentative for inclusion in the methods of chemical analysis of portland cement.

As a result of detailed study of previously issued specifications covering crushed stone and crushed slag, new tentative specifications were developed by Committee D-4 and issued to replace a number of the existing standards.

Several years work in developing information which would serve as a reliable basis for recommending specifications for asphalt plank resulted in proposed requirements which are published for information in the report of Committee D-4 covering two types of plank used for bridge floors; namely, plain and mineral-surfaced plank. The requirements cover the mineral surfacing, asphalt cement, fiber and mineral filler used and provide for certain sampling and testing methods covering absorption test, brittleness, and indentation tests.

A new specification covering asphalt mastic for use in waterproofing was approved on the recommendation of Committee D-8 on Bituminous Waterproofing and Roofing Materials.

New Standards for Masonry Units

New specifications for concrete masonry units for use in construction of catch basins and manholes were proposed by the committee on Manufactured Masonry Units C-15. These cover the strength and absorption properties and general requirements for such units made from portland cement and suitable aggregates. The new specifications for structural clay load-bearing wall tile incorporate a method of specifying dimensions and shape which has the support of a good portion of the members of the committee, it was reported. These specifications were approved as tentative and when adopted as standard will replace the existing specifications, C 34-36.

Acting on the suggestion of its subcommittee on lime for the chemical industries, there were included in the report of committee C-7 three proposed specifications published for information and comment, These cover: quicklime for causticizing leached liquors in the soda-pulp process for the manufacture of paper; quicklime for use in the manufacture of paper pulp where the precipitated carbonate is employed as a pigment or filler; and method of determining available lime in high-calcium quicklime and hydrated lime by the rapid sugar test.

Two new tentative standards, one covering methods of procedure for measuring the dimensions, warpage and bulk specific gravity of refractory brick, and the second on true specific gravity of burned refractory materials were proposed by Committee C-8 on Refractories.

An informal report was presented by Committee C-18 on Natural Building Stones and Slate. The committee plans to conduct further series of tests in order to develop information on size and form of test specimens in the compression test procedure.

Sample Coal by Ash Content

The Committee on Coal and Coke submitted a new method of sampling coals classed according to ash content. This is applicable to ordinary commercial sampling and is designed to have an accuracy such that in 95 cases out of 100, the ash content of the sample will be within plus or minus 10 per cent of the true ash content of the coal samples. A modification of the method is given also for conditions requiring greater accuracy. In the proposed method, coals are divided for sampling into four groups, depending on ash content, and each group is subdivided according to size of coal.

Two new tentative methods of test were accepted by Committee D-9 on Electrical Insulating Materials. One of these involves the testing of solid electrical insulating materials for arc resistance—this method has been found very useful, especially in comparing the arc resistance of different materials, the committee report indicated. The other covers a method of acetone extraction of phenolic molded or laminated products. Some years ago it was found that uncured bakelite could be reacted upon by acetone, creating a staining of the acetone solution in which the incompletely cured part was immersed. This led many molders to believe that it could be used as a test for curing. However, the committee reported that its work has demonstrated that it is not a reliable test for curing but that an acetone

extraction could be used as a reliable identification test.

Four tentative standards are to be submitted to a letter ballot of the A.S.T.M. for adoption; namely, the testing of resistance to impact, the test for insulation resistance, the method of test for grading natural mica, and for testing molding powders used in manufacturing molded electrical insulators.

A number of recommendations submitted by Committee D-2 on Petroleum Products and Lubricants in its 1938 report were accepted by the Society, including five new tentative standards covering test for acid heat of gasoline, test for unsulfonated residue of plant spray oils, specifications for Stoddard solvent, test for determining ash content of petroleum oils and a method for determining saponification number which represents a consolidation of the present method D 94-36 and D 438-36 T. The test for acid heat of gasoline may be used for determining the acid heat of aviation and motor gasoline having Reid vapor pressures of 15 lb or less. This method indicates roughly the amount of unsaturated hydrocarbons in the gasoline that are reactive with sulfuric acid under the conditions of this test. The specifications for Stoddard solvent cover a grade of petroleum distillate of low flammability used in dry cleaning.

A proposed method of test for determining ignition-quality characteristics of diesel fuels and further changes in the diesel-fuel-oil classification originally published in the 1937 report were also proposed.

New Soap Standards

Committee D-12 on Soaps and Detergents reported four new tentative specifications covering white floating toilet soap, chip soap, powdered laundry soap and ordinary laundry bar soap. Four new tentative standards comprising methods of test for particle size of soaps and other detergents, determination of combined sodium and potassium oxides in soaps, chemical analysis of sulfonated oils, and chemical analysis of special detergents, were also offered.

During the next year, this committee plans to consider additional definitions and specifications for soap powders and built soaps and will continue its active work on certain other important problems including standardized requirements for dry cleaning and metal cleaning detergents and also for soaps for textiles.

The committee reported that the specifications it has developed provide an equitable basis for payment, a problem which has been a source of considerable difficulty in the trade and has resulted in loss to shippers. Soap dries rapidly, and deliveries may, therefore, be short weight although still containing all the original soap content. The A.S.T.M. specifications as developed by Committee D-12 provide methods for settlement taking account of the loss in weight due to the drying out of moisture by making allowances for resulting increased percentage of soap contents in delivery.

Are Your Standards Up-to-Date?

One hundred thirty-five different standards in one order! This is what one of our large oil companies found it needed to keep its standardization program up-to-date when the American Standards Association sent it the most recent list of approved American Standards.

The company received 20 per cent discount on the order as a member of the American Standards Association.

Extensive progress in the work of Committee D-13 on Textile Materials was shown in the work of this committee. Six new tentative standards were presented, including specifications for single-ply bleached cotton broadcloth, bleached wide cotton sheeting, and terry (turkish) toweling, and methods of test for fastness to light of colored textile fabrics, spun rayon yarns and threads, and yarns spun from wool mixed with fibers other than wool. The three specifications are based on extensive analyses and comparisons made by the Bureau of Home Economics, U. S. Department of Agriculture. The test requirements for yarns spun from wool have been necessitated by the extensive use of this material.

Committee D-17 on Naval Stores has developed new methods of sampling and grading rosin, which were accepted for publication as tentative. These amplify and supplement the Regulations of the Naval Stores Act.

Tests for Rubber Belting

Committee D-11 on Rubber Products submitted a number of important recommendations, including new tentative methods of testing flat rubber belting. These amplify and replace the existing Standard Methods of Testing Rubber Belting Used for Power Transmission (D 378-36). In the new standard, test procedures are given for all flat types.

Several new tentative standards were accepted

on the recommendation of Committee D-1 on Paint, Varnish, Lacquer, and Related Products including specifications for aluminum pigment paste for paint, c. p. para red toner, c. p. zinc yellow (zinc chromate), titanium dioxide pigments, and zinc sulfide pigments. New methods of sampling and testing aluminum powder and aluminum paste and a new method of test for reactivity of paint liquids were also accepted for publication.

Definitions and methods of test for determining gloss of paints have been developed and will be subjected to practical test during the coming few months, the committee reported.

Dr. H. A. Gardner, the American representative on the International Standards Association's Committee on Paint Materials, advised that during the past year discussions have been carried on by mail on specifications and methods of analysis of red lead, white lead, zinc white, lithopone, iron oxide, and titanium white. It is expected that the ISA Committee may make recommendations for the analysis of zinc white and lithopone, as a result of the cooperative studies.

Welding Handbook Just Published

The fundamentals of welding processes, the materials used and testing methods involved, and the applications of welding are discussed in the *Welding Handbook*, just published by the American Welding Society. Outstanding authorities in each field are authors of the different chapters.

A chart of welding processes and definitions of terms prepared by the Nomenclature, Definitions, and Symbols Committee of the American Welding Society is included in the *Handbook*, as well as welding symbols, and instructions for their use prepared by the committee and recommended to the American Standards Association for adoption as American Standards. In addition the book is divided into sections on Processes; Materials and Metallurgy; Testing; Welding Applications; Critical Digests of Welding Literature; and Testing Terms, Physical Constants and Conversion Tables.

The *Welding Handbook* is available from the American Welding Society, 33 W. 39th Street, New York, at $6.00 per copy in the United States, $6.50 elsewhere.

Reaffirm Simplified Practice Recommendations

The following Smplified Practice Recommendations have been reaffirmed without change by the standing committees of the several industries responsible for reviewing the recommendations regularly, the Division of Simplified Practice, National Bureau of Standards, announces:

Bank Checks, Notes, Drafts, and Similar Instruments, SPR R50-26
Basic Dimensions for Cones for Warp and Knitting Yarns and Hole Sizes for Bobbins for Filling Cop Winders, SPR R152-34
Blackboard Slate, SPR R15-35
Block Sizes for Calcimine Brushes, SPR R121-31
Clay Tiles for Floors and Walls, SPR R61-30
Commercial Forms (Invoice, Purchase Order, and Inquiry), SPR R37-28
Composition Blackboard, SPR R75-29
Copper Wire Nails, SPR R150-34
Dental Hypodermic Needles, SPR R108-34
Fast Selvage Terry Towels, SPR R119-31
Glass Containers for Mayonnaise and Kindred Products, SPR R131-35
Glassine Bags, SPR R107-31
Granite Curbstone, SPR R102-33
Hole Sizes for Taper Tubes for Filling Cop Winders, SPR R153-34
Ice Cake Sizes, SPR R96-28
Ice Cream Cups and Cup Caps, SPR R132-36
Milling Cutters, SPR R36-34
Singletrees, Doubletrees, and Neckyokes, SPR R134-32
Structural Slate, SPR R13
Turnbuckles, SPR R71-28
Vitrified Paving Brick, SPR R1-36

With the exception of Blackboard Slate and Commercial Forms, which are out of print, copies of the above recommendations may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. Clay Tiles for Floors and Walls (R61-30) and Structural Slate (R13) are 10 cents each; the other recommendations are five cents each. Mineographed copies of the two recommendations which are out of print are available without charge from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Safety Handbook Is for Sale

The *Handbook of Industrial Safety Standards*, reviewed on page 161 of INDUSTRIAL STANDARDIZATION, July, is not available without charge as our article said, but may be purchased at 39 cents per copy.

The *Handbook* may be ordered from the National Conservation Bureau, 60 John Street, New York.

Standardization of Finishing Materials[1]

How to develop economy and uniformity through the application of a standardization program in selecting materials

by

E. A. Zahn

Schenectady Works Laboratory
General Electric Company

MASS production and variety manufacturing have made more evident at the present time than ever before the necessity for material standardization. In many industrial organizations, and especially in those where several plants are operated in various localities, a surprising number of different finishing materials are being used to produce or to nearly simulate a certain standard, previously set. Unfortunately, a finished piece can be exactly like the standard only when the same finishing material is used as was used to prepare the standard itself.

The essentials to be considered when material standardization is to be attempted are both numerous and important. Material quality is the foremost of these; and unless a material can be found that will produce quality in conjunction with beauty of appearance, then it would be highly advisable to forget standardization until some extensive tests bring to light a material which is capable of giving both features. Another of the more essential features of a material is its ability to lend itself to a variety of applications, of which automatic finishing is the most important and rapidly becoming useful in applications previously considered impossible. The greater the number of application possibilities that can be built into a finishing material, the more it can be used as a general-utility product which in turn produces a great variety of finished parts with an identical appearance.

The gloss and color standards are to be considered for possible elimination of fugitive colors and such glosses as are characteristic only of certain types of finishing materials. The glosses should be confined to flat, semigloss, or high gloss. Any intermediate glosses are not only very difficult to produce, but vary greatly with the different surfaces on which they are applied and also with each different application method. The semigloss finish is naturally the least preferred and is therefore the least used of the three. If and when a minimum of glosses and colors has been selected,

With this viscosimeter accurate viscosity measurements can be made in 30 seconds, by raising the instrument from the liquid and starting the timer simultaneously. The timer is stopped when the stream of liquid flowing through the orifice at the base of the cup breaks suddenly near the orifice. The cup remains in the liquid when not in use. The viscosimeter cups are made with three different-sized openings for use with a variety of liquids. Satisfactory readings are obtained by selecting the orifice which requires at least twenty seconds for complete drainage.

[1]Abstract of article published in *General Electric Review*, May, 1938.

standardization can be highly effective in reducing the number of finishing materials.

A good start in a material standardization program could be made by first considering the black finishes.

Two years ago a survey was made in the various plants of a manufacturer to definitely determine the exact number of black materials being purchased in volume to find that there were actually one hundred and eleven such items. The standard glosses for black were flat, semigloss, semihigh gloss, and high gloss. The semihigh gloss was eliminated, leaving three standards, all of which were fairly easy to produce. The high gloss, as in all cases in the past, was found to have the greatest appeal to purchasers and was therefore given the first consideration.

111 Items

A bogy of twelve materials was arrived at by allowing a flat, semigloss, and high-gloss material from each of four general types of materials: namely, (1) Japan, (2) Baking Synthetic, (3) Air-dry Synthetic, and (4) Lacquer. All of the one hundred and eleven materials were thoroughly tested; this resulted in the selection of fewer choices in each type. With the co-operation of the persons responsible for finishes in the various plants, a choice was made by means of which the number of blacks was reduced to 16. Another series of tests proved the value of baked japan finishes for ordinary applications and also proved its value with respect to automatic finishing. The results of these tests were of great value, particularly since the finish cost savings, through the development and use of a special high-gloss japan, show a possibility of thousands of dollars annual savings over previous methods and materials.

As standardization was effected on the various items, they could be bought on short-term contracts (say, six months) which in turn could further reduce the buying cost. As soon as a product has been standardized, definite specifications can be set up for the testing of competitive materials. Possible improvements might be pointed out which would result in greater variety of application possibilities and also greater coverage. In this way the final material cost could be continuously reduced while the quality of the material is either maintained or improved.

As the various items become standards, they must be centrally controlled in order to avoid any possibility of conflicting approvals of future materials. The conditions in each of the various plants must be considered in each of the new test programs so as to continuously keep the product up-to-date.

Once a material is in general use there are numerous benefits which are of particular advantage to the various stations in which it is used. For example, a black baking japan that is being used in seven or eight different automatic dipping machines can be tested for variations of viscosity with temperature and a regular chart prepared for factory use.

With an approved instrument[1] for checking the viscosity at short intervals in the factory, all mixture control problems are eliminated at all the stations at one time. Separate viscosity-temperature curves can be prepared on the same material for use with either hand dipping, spraying, or any other type of application. This type of control is beneficial only when centralized and when it can apply to any type of paint which might be in general use.

All periodical tests should be made by comparison with the approved material. If the various samples are carefully prepared on identical sur-

[1] "A New Method for Viscosity Determination," by E. A. Zahn, *General Electric Review*, vol. 40, p. 285, June, 1937.

Applying the finish which has been checked according to the standards decided upon

faces, dried identically the same length of time, and evaluated in comparison, there is little or no possibility of error in the selection of improved materials.

The qualities considered (usually by stated tests) in reviewing new samples as possible replacements of present contracted materials are approximately as follows:

(*1*). Adhesion to all surfaces in general use.
(2). Accelerated aging tests.
(*3*). Flexibility tests after accelerated aging on all surfaces.
(*4*). General appearance. (By visual comparison)
(*5*). Material handling qualities.
(*6*). Moisture resistance over all surfaces.
(*7*). Flexibility after moisture-resistance tests.
(*8*). Salt-spray tests.
(*9*). Flexibility tests after salt spray.
(*10*). Water-immersion tests.
(*11*). Acid- and alkali-resistance tests.
(*12*). Mar-resistance and handling tests.
(*13*). Discoloration tests accelerated in the dark.
(*14*). Light discoloration tests.
(*15*). Out-of-door weathering tests. (Optional)

By a general vote of the interested parties of the finishing departments each test to be made should be evaluated as to its importance. As the tested pieces are then grouped for the final evaluation, each system can be given a comparative numerical rating which is usually computed as per cent failure of the tested material.

Each vendor submitting test samples should be given a detailed report of the behavior of his material in comparison with that of the best sample in test. In this way it would not be necessary to disclose the name of the manufacturer of the product selected nor would it be necessary to delay testing of future samples any longer than the short space allowed for contract buying. The tested pieces should be kept on hand for several months after reports have been issued in order that the vendors may view them as a possible aid toward future improvements.

After standardization has been partially effected, the testing of materials is greatly simplified because the material types can be tested in groups at regular intervals. Each vendor would then realize the importance of punctuality in submitting his samples, and he would also be made to realize that the quality of his product as represented by the submitted sample is his sole means of obtaining a contract.

Propose Simplified Practice On Open Web Nailer Steel Joists

A proposed simplified practice recommendation covering sizes of open web nailer type steel joists has been submitted to all interests for consideration and approval, according to an announcement of the Division of Simplified Practice, National Bureau of Standards.

The joists are open web steel joists having a wood nailing strip securely attached to the top chord for the primary purpose of fastening a wood floor thereto. The proposal recommends six designations of joists in five depths, ranging from 8 to 16 inches, inclusive. It gives for each designation the allowable total load in pounds per linear foot of joist, resisting moment in inch pounds, and maximum end reaction in pounds.

Application for the establishment of this recommendation was made by the producers, acting through the Steel Joist Institute, and is a direct result, according to the announcement of the proposal, of the benefits realized by the same group from the promulgation, in 1930, of a similar recommendation on regular open web steel joists.

Mimeographed copies of the proposal may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Need Uniform Accident Reports To Solve Traffic Accident Problem

More detailed and uniform accident reports are needed in the United States in order to provide a basis for sound highway engineering, Sidney J. Williams, public safety director of the National Safety Council, told the International Road Congress at a meeting recently at The Hague, the Netherlands. Quoting from a report submitted by A. A. Anderson of the Portland Cement Association, Mr. Williams said:

"It is essential that such information include data which will permit listing accidents on a vehicle mile basis for specific highways, day or night; and a rating to be made of the physical safety of each highway in relation to conditions causing accidents. This will mean mandatory provisions by the state or local government for reporting all details incident to highway accidents. When all contributing factors are obtained, it will be possible to develop an accident expectancy formula."

This would enable accident frequency prediction and determination of how much rebuilding of a given highway would reduce accidents, Mr. Williams said.

New ASA Committees to Develop Standards On Building Loads and Gypsum Concrete

Nine committees, under ASA Building Code Correlating Committee, are now working on building code projects. Work now going forward includes building code requirements for fire protection and fire resistance; chimneys and heating appliances; light and ventilation; fire extinguishing equipment; excavations and foundations; iron and steel; and administrative requirements

CONTINUING the development of the ASA building code program, two additional projects have recently been approved by the Standards Council in accordance with recommendations of the Building Code Correlating Committee.

The sectional committee that will develop standards for the first of these, Building Code Requirements for Minimum Design Loads in Buildings, will operate under the leadership of the National Bureau of Standards which has accepted sponsorship for the project. The committee will consider such subjects as the minimum live load assumptions to be made in the design of buildings, wind pressure and other lateral pressures, loads resulting from earthquakes, dead loads, and permissible reductions in live loads.

Early code requirements specified design live loads which were usually considerably greater than the actual loads expected on the structure from the particular occupancy. This may have been largely a matter of tradition, or it may have been done partly in an effort to offset a lack of knowledge of the strength of the structure itself, and partly to provide for possible increases in floor loads due to unreported changes of occupancy. Among the older buildings it is common today to find such changes in occupancy without any apparent structural changes. In requiring the buildings to be designed for heavier loads than those expected for the occupancy, a margin of safety to provide for unexpected conditions was obtained, but considerable economy in construction was sacrificed.

Scientific Design Possible

With a better understanding of the strength of materials and structures, and a gradual improvement in control of occupancy changes through the use of certificates of occupancy, the need for excessive design load assumptions has become less and buildings can now be designed on a more scientific basis. Live-load requirements in codes should now represent, in the opinion of many engineers, the minimum for which buildings of each class of occupancy must be designed and built in order to protect occupants and owners from loss of life or property through partial or total structural failure.

Although a gradual improvement in the reasonableness and uniformity of load requirements in codes has taken place, examination of a number of recent codes discloses that considerable variation still exists, it is reported. The load to be expected on the first floor of an ordinary two-story dwelling would seem to offer no particular problem in its determination, nor does there seem to be any sound reason for much variation in this assumed loading as between cities. Yet in examining the live-load requirements of 100 codes a range of 40 to 100 lb per sq ft was found, 62 municipalities requiring 40 lb per sq ft, 25 requiring more than 40 lb per sq ft, and 13 having no requirement at all. Since the contents of the average dwelling do not vary a great deal over the country, it would appear that an unnecessary amount of materials and labor is being required in some localities. Standardization on a scientific basis of this item alone should produce beneficial results of special value in the field of low-cost housing.

The new committee will not start from scratch in its work. The former Building Code Committee of the Department of Commerce made a careful study of this subject some years ago and from the information then available, produced recommendations which have effected a real improvement in building code requirements. The report, "Minimum Live Loads Allowable for Use in Design of Buildings", issued by the committee in 1925, is generally recognized as the outstanding work in

this field, and the recommendations have had wide acceptance. The report will serve as a base for the recommendations of the new committee.

It is expected that further investigation of the subject in the light of more recent developments in the building industry will enable the committee to produce authoritative information that should prove of considerable benefit to those engaged in writing or revising building codes.

For the second project, Building Code Requirements for Reinforced Gypsum Concrete, joint administrative responsibility has been assigned to the Building Officials' Conference of America and the Gypsum Association.

Reinforced gypsum concrete has been extensively used on floor and roof construction in buildings, and several systems of construction have been developed. The subject has been inadequately treated in building codes and it is believed the new committee can make important contributions in this field.

The scope of the project covers construction requirements for reinforced gypsum concrete in building construction and the establishment of working stresses suitable for inclusion in a building code. This will include consideration of quality of materials; special factors and formulas controlling design, methods, and details of construction; and the values for usual types of stresses.

Organization of the sectional committee to consider this subject will follow soon, it is expected.

Committee Starts Work On Loading Platforms

Elects Morgan and Fenner Chairman and Vice-Chairman

A MEETING to organize the work on standard heights for loading platforms, July 29, elected officers and appointed a subcommittee to study what the committee's work should cover to help eliminate dimension variations now causing additional expense in loading and unloading.

Charles G. Morgan, Jr., of the American Trucking Association, was named chairman of the committee which will develop the standards, and D. C. Fenner, Automobile Manufacturers Association, was named vice-chairman. The secretary is to be selected by the chairman and vice-chairman.

Variations in heights and other dimensions of railroad car and truck doors as well as of freight loading platforms, which add to the difficulty and expense of loading and unloading freight, brought a request to the American Standards Association from the American Society of Mechanical Engineers and the Society of Terminal Engineers, in 1937, for consideration of the problem under ASA procedure. A general conference of organizations interested, in April, 1937, resulted in a request that the American Standards Association initiate a project for standard dimensions for loading platforms. The ASA Standards Council approved the initiation of such a project April 29, 1937, and outlined the scope of the new project as including:

"Height of loading platforms to accomodate various classes of railroad cars and highway vehicles in relation to rail level and street or yard level; distance from track center to edge of loading platform; and vertical and horizontal clearances for highway vehicles."

The American Trucking Association, Inc., has accepted the administrative leadership for the work of the committee.

A subcommittee appointed at the July 29 meeting will consider whether the approved scope of the project covers the problem satisfactorily and will make recommendations for the appointment of subcommittees once the scope has been finally decided on. Its members are D. C. Fenner, Automobile Manufacturers Association, *Chairman*; H. B. Whipple, American Warehousemen's Association; and A. R. Wilson, Association of American Railroads.

British Propose Standard Apparatus For Determination of Water

A proposed British standard specification for apparatus for the determination of water by distillation with an immiscible liquid has just been received by the American Standards Association. It will replace two earlier specifications, British Standard Specification for Graduated Receivers for Dean & Stark Apparatus and British Standard Specification for Apparatus for the Determination of Small Quantities of Water by Distillation with an Immiscible Liquid.

Comments on the proposed standard are now being received by the British Standards Institution. A copy may be borrowed from the American Standards Association.

Know Your
Electrical Indicating Instruments

Are they Grade A or Grade B Portable?

What is the principle of operation?
(The American Standard lists eight principles by which electrical indicating instruments are classified.)

What type of protection do they have?
(The standard lists 15 types.)

Does the temperature rise exceed the standard values?

For standard specifications and tests for the type of instrument you use (except those provided with arrangements for curve drawing, contact making, etc., and small instruments used where low cost is essential) consult the

American Standard for Electrical Indicating Instruments - - - - - - - - (C39.1-1938)

40 cents

It covers:

ammeters
voltmeters
wattmeters
volt-ampere meters
reactive-volt-ampere meters (varmeters)
frequency meters
power-factor, reactive-factor and phase-angle meters
synchroscopes
microfaradmeters
ohmmeters

(This standard, prepared by the Sectional Committee on Electrical Measuring Instruments (C39), is based on the American Institute of Electrical Engineers' standard, and on standards of the National Electrical Manufacturers Association and the U. S. Navy Department. Members of the American Standards Association are entitled to 20 per cent discount on all approved American Standards ordered through the ASA office.)

AMERICAN STANDARDS ASSOCIATION

29 West 39th Street **New York**